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SCENIC QUALITY RATINGS OF NEAR-VIEW FORESTED AREA SLIDES

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Scenic Quality Ratings of Near-View Forested Area Slides

Final Report

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Introduction and Objectives

The Scenic Beauty Estimation (SBE) method developed by Daniel and Boster (1976) has proven to be a reliable and valid system for measuring forest scenic quality. Successful applications of the SBE method in a number of contexts has confirmed the utility of the landscape assessment system. SBEs have been used to gauge the effects of silvicultural treatments (Daniel, et al. 1973, Benson and Ullrich 1981), to map the scenic beauty of a forested landscape (Daniel et al. 1977), to evaluate the scenic impact of forest insect damage (Buhyoff et al. 1982), and the scenic quality of alternative forest road corridors (Schroeder and Daniel 1980), and is a basis for mathematical models that predict scenic beauty perceptions using forest mensuration variables as predictors (Arthur 1977, Schroeder and Daniel 1981).

Observer panels used in these and other studies have been composed of student volunteers (including samples from classes in psychology, forestry, natural resources, and landscape architecture), forestry professionals, "environmentalist" groups, and some more general public groups. Some studies (e.g., Arthur 1977, Daniel and Boster 1976) made specific comparisons of the reactions of different observer panels to the same set of forest scenes. These studies report substantial agreement among all observer groups sampled, but there were also some differences noted. For example, student groups showed somewhat less marked discriminations between forest areas than did other public groups. Arthur (1977) found that a slightly different model was required for predicting student's scenic judgements than that for predicting a general public group's judgements.

Discrepancies between the esthetic perceptions of different public groups, even though small, could have important implications for current efforts to develop Scenic Beauty prediction models (Schroeder and Daniel

1981). The purpose of these models is to provide national forest managers with a means for predicting the public's perception of the scenic consequences of alternative management actions. If perceptions differ from one public audience to another, predictions may not be valid for some groups or different prediction models may be required for different subgroups of the forest visiting public. In this context, the first three objectives of the study are to:

1. Determine the similarities and differences between SBE values of near-view ponderosa pine slides obtained from student observer groups and those obtained from non-student public groups, where both sets of groups do not represent any particular natural resource management viewpoint, and compare scenic quality prediction models developed with SBE values obtained from each of the two sources.
2. Test the usability of student observers drawn from the general student body in rating slides of forest scenes to obtain SBE values.
3. Determine the similarities and differences between SBE values obtained from volunteer psychology students and members of the general student body.

The potential utility of site-level near-view scenic beauty models is documented by previous research (Arthur 1977, Schroeder and Daniel 1981). More extensive tests were needed, however, to examine the importance of mensurational variables not previously considered, to investigate the utility of separate preharvest and postharvest models, and to test the utility of timber stand-level near-view scenic beauty models. The fourth objective responds to these concerns:

4. Obtain judgements for 5400 slides taken in Woods Canyon and Bar-M Watersheds in 1979 to 1981 and develop near-view models focusing on both preharvest and postharvest conditions at the site and stand level.

In the specification of stand-level models, data from individual inventory sites within stands are averaged. While this averaging poses no problem for biophysical characteristics as long as the individual sites are properly located, it does create a potential problem for scenic beauty estimates derived from public preference judgements, for we do not yet know to what extent observers' scenic judgements of areas such as whole timber stands are estimated by the average of individual judgements for specific scenes within the stand. This concern led to the fifth objective:

5. Test the validity of representing timber stand scenic beauty with averages of scenic beauty estimates obtained for slides shown without regard to stand distinctions, by obtaining single judgements for sets of slides representing whole stands and comparing those judgements via statistical tests with the average of site-level scenic beauty estimates.

Application of the SBE method to determine the relative scenic beauty of forest scenes and build models describing scenic beauty as a function of biophysical variables in the scenes requires that sets of slides be shown to observers who provide scenic beauty judgements. It is possible that the relative proportion of scenes, in the mix of scenes presented to a given group of observers, exhibiting some forest condition affects the preference judgements, such that the same slide would be rated differently depending on the other slides in the set presented for judgement. If this happens, it could have important implications for scenic beauty modeling efforts, requiring careful attention to the scene mix at a very early stage in the model development process. This concern is the topic of the sixth and last objective:

6. Determine whether the relative percentages of preharvest versus recent postharvest slides in slide sets affect scenic preferences.

Methods and Results

Objectives 1, 2, and 3

The basic approach was to make specific comparisons between SBEs obtained for a variety of different forest areas/types when different observer populations are used. Slides depicting forest sites on Woods Canyon and Bar-M Watersheds of the Coconino National Forest, taken from 1979 to 1981 as part of the Multi-Resource Inventory (MRI), plus slides from the Wild Bill pastures and the Fort Valley Experimental Forest, also on the Coconino National Forest, were used in the presentations.

Observer groups included:

1. College student volunteers from introductory psychology classes (some received "extra credit" points for their participation);
2. paid observers recruited from university organizations, such as dormitories, fraternities, sororities, and social and service clubs;
3. paid observers recruited from "general public" groups, including churches, parent-teachers organizations, civic and service organizations.

Following the procedures specified by the SBE method (Daniel and Boster 1976), each observer group (panel) rated slides using a 10-point scenic beauty scale. These ratings were subjected to psychophysical scaling analysis to yield an SBE value for each slide for each observer group.

Both raw rating responses and SBEs were subjected to statistical analyses comparing the results from the different groups. Analysis of variance techniques were employed to assess differences between and within observer group sets and to determine the statistical significance of any obtained differences. Results from these analyses are presented in part in the attached research paper "Modeling Forest Scenic Beauty: Concepts and

Application to Ponderosa Pine." In addition, correlation coefficients were calculated for pairs of groups to determine the extent of agreement in the ratings and SBEs assigned to the forest scenes by the different observers. Tables 1-4 display the intercorrelations among the large number of independent observer groups that judged "Multi-Resource Inventory" (MRI) and related forest slide sets. In all cases correlations are based on the 25 "baseline" slides that were common to the groups compared. The majority of the groups judged the "New Woods Canyon" baseline set, but "Old Woods Canyon," "MRI A" and "MRI B" were also used for some groups. Note that no comparisons are possible between groups that judged different baseline slide sets.

The majority of observer groups were composed of student volunteers from introductory level psychology classes at the University of Arizona. Other groups included paid subjects recruited from campus organizations; some of these observers participated in more than one study. Some groups were recruited from the general (Tucson, AZ) public, including several church and civic groups, high school students, and several parent groups.

Inspection of the baseline correlation tables reveals some variability in the level of agreement among groups. However, consistent with most previous research, there is no indication that student groups (paid or volunteer) differ consistently from general public samples. It appears that low intercorrelations (<.70) are as likely between student groups as between student and public groups. The variation in coefficients seems to have resulted from ideosyncratic variations in the composition of groups and/or the particular slide sets that were judged by each group.

Objective 4

The attached research paper "Modeling Forest Scenic Beauty: Concepts and Application to Ponderosa Pine," RM-256, and the attached manuscript "Models

for Predicting Scenic Beauty of Timber Stands," (see studies 1-3) describe the methods and results of the studies accomplished in response to objective 4.

Objective 5

"Study 4" reported in the attached manuscript, "Models for Predicting the Scenic Beauty of Timber Stands" describes the methods and results of the study performed in response to objective 5.

Objective 6

The attached manuscript, "Context Stability in Preference for Forest Landscapes," describes the methods and results of the study completed in response to objective 6.

References Cited

Please see the Literature Cited section of "Modeling Forest Scenic Beauty: Concepts and Application to Ponderosa Pine" (pp. 28-30).

Table 1

NEW WOODS CANYON BASELINES

MRI-80, CONTEXT MRI, SEASONAL LIGHT MRI

		All MRI 80																		MRI CTX				SLMRI							
		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	26	27	30	1	2	3	4	21	22	23	31	32	33	$\bar{x}_r$	
MRI-80	8	•	.80	.57	.65.	.71	.65	.72	.64	.64	.64	.75	.67	.58	.79	.67	.63	.65	.73	.66	.60	.59	.66	.74	.63	.68	.56	.64	.69	.65	.70	.69	
MRI-80	9			.64	.83	.85	.69	.72	.81	.78	.71	.77	.83	.81	.79	.78	.77	.88	.86	.78	.78	.70	.83	.85	.74	.83	.76	.78	.79	.79	.80	.78	
MRI-80	10				.73	.77	.77	.75	.79	.79	.85	.77	.69	.70	.79	.74	.82	.75	.69	.74	.66	.74	.68	.77	.80	.76	.66	.68	.67	.74	.67	.73	Return ES Paid
MRI-80	11					.88	.81	.81	.90	.83	.80	.74	.90	.93	.82	.80	.82	.82	.77	.84	.87	.65	.73	.80	.81	.78	.81	.82	.81	.83	.82	.81	
MRI-80	12						.82	.86	.92	.83	.80	.80	.91	.87	.86	.91	.90	.88	.84	.88	.90	.76	.82	.90	.86	.81	.79	.85	.86	.87	.90	.85	
MRI-80	13							.83	.84	.73	.77	.74	.79	.76	.82	.76	.78	.74	.73	.82	.77	.61	.69	.80	.76	.61	.59	.73	.76	.71	.80	.75	
MRI-80	14								.91	.81	.86	.83	.85	.80	.88	.90	.85	.77	.75	.79	.81	.66	.72	.83	.86	.78	.75	.84	.77	.82	.84	.75	
MRI-80	15									.89	.89	.88	.89	.92	.87	.92	.89	.89	.83	.90	.92	.74	.83	.91	.91	.90	.84	.87	.86	.89	.87	.87	
MRI-80	16										.90	.86	.82	.83	.86	.87	.88	.89	.85	.85	.86	.82	.88	.90	.92	.92	.93	.89	.91	.92	.85	.84	
MRI-80	17											.87	.82	.79	.87	.88	.90	.80	.80	.82	.81	.79	.82	.83	.87	.84	.84	.81	.79	.84	.79	.79	
MRI-80	18												.78	.80	.87	.83	.81	.84	.82	.90	.83	.72	.85	.87	.86	.86	.80	.78	.82	.80	.83	.79	
MRI-80	19													.83	.87	.86	.87	.88	.81	.85	.88	.71	.84	.82	.85	.82	.82	.85	.84	.81	.84	.86	
MRI-80	20														.77	.84	.81	.84	.74	.89	.91	.61	.73	.82	.77	.78	.81	.77	.80	.82	.86	.80	
MRI-80	21															.86	.87	.86	.85	.88	.76	.72	.84	.87	.86	.87	.78	.83	.84	.78	.88	.83	
MRI-80	22																.93	.85.	.85	.83	.87	.73	.81	.88	.88	.84	.85	.81	.82	.85	.89	.84	
MRI-80	23																	.87	.80	.84	.81	.79	.86	.88	.91	.84	.88	.83	.84	.86	.89	.84	
MRI-80	24																		.86	.89	.82	.74	.92	.88	.90	.91	.87	.81	.90	.81	.84	.84	
MRI-80	26																			.79	.80	.78	.85	.84	.83	.85	.82	.83	.80	.77	.82	.81	Church Group
MRI-80	27																				.88	.67	.84	.91	.85	.83	.80	.80	.90	.80	.90	.80	
MRI-80	30																					.71	.79	.85	.83	.79	.83	.83	.85	.86	.83	.79	
CTXMRI	1																						.82	.78	.79	.81	.81	.78	.78	.85	.64	.73	
CTXMRI	2																							.87	.86	.92	.87	.86	.91	.85	.85	.82	Student Vol.
CTXMRI	3																								.90	.89	.82	.87	.91	.89	.89	.85	Student Vol.
CTXMRI	4																									.90	.90	.86	.89	.88	.83	.84	Student Vol.
SLMRI	21																										.85	.86	.91	.87	.81	.84	Student Vol.
SLMRI	22																											.83	.87	.89	.83	.81	Student Vol.
SLMRI	23																												.86	.91	.83	.82	Student Vol.
SLMRI	31																													.88	.85	.83	Student Vol
SLMRI	32																														.83	.83	Student Vol.
SLMRI	33																														•	.83	Student Vol.
GRAND X																																.84	

Table 2.

OLD WOODS CANYON BASELINE

MRI 80 RUNS 1-7

		MRI 1	MRI 2	MRI 3	MRI 4	MRI 5	MRI 6	MRI 7	$\bar{X}$	
MRI	1	*	.72	.74	.59	.69	.68	.62	.67	
MRI	2			.76	.67	.81	.76	.81	.76	
MRI	3				.70	.74	.74	.72	.73	
MRI	4					.70	.65	.72	.67	Outside Paid Group
MRI	5						.84	.90	.78	
MRI	6							.82	.75	
MRI	7							*	.77	
GRAND $\bar{X}$									.73	

Table 3.

MRI A BASELINES

MRI 79 and RETURN GROUPS

		MRI 1	MRI 4	MRI 5	MRI 8	MRI 9	MRI 11	MRI 13	RTN 1	RTN 3	RTN 5	$\bar{X}$	
MRI	1	*	.91	.90	.88	.88	.92	.93	.87	.86	.85	.89	
MRI	4			.85	.80	.87	.84	.84	.86	.87	.81	.85	All
MRI	5				.93	.88	.78	.91	.90	.85	.85	.87	Student
MRI	8					.88	.79	.87	.88	.81	.85	.85	Volunteers
MRI	9						.84	.87	.90	.86	.82	.87	
MRI	11							.89	.81	.78	.75	.82	
MRI	13								.91	.89	.82	.88	
RTN	1									.93	.84	.88	
RTN	3										.88	.86	
RTN	5										*	.83	
GRAND $\bar{X}$												.86	

Table 4.

MRI-B BASELINE

MRI 79 and RETURN GROUPS

		MRI 2	MRI 3	MRI 6	MRI 7	MRI 10	MRI 12	MRI 14	MRI 15	RTN 7	$\bar{X}$	
MRI	2	*	.84	.77	.91	.77	.89	.86	.84	.81	.84	
MRI	3			.81	.87	.88	.85	.86	.81	.81	.84	
MRI	6				.74	.83	.74	.70	.84	.82	.78	High School
MRI	7					.78	.93	.90	.81	.76	.84	
MRI	10						.84	.82	.88	.83	.83	
MRI	12							.88	.84	.78	.84	
MRI	14								.82	.72	.82	
MRI	15									.84	.84	
RTN	7									*	.80	Return Group
GRAND $\bar{X}$											.83	